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ABSTRACT

This study tested the relationships among attitudes toward a course, instructor credibility, attraction, homophily, immediate recall, and student-teacher interaction. The major question explored how much variance of immediate recall and student-teacher interaction is attributable to course attitudes and instructor valence. Student grade point averages were used as a control. Two propositions were tested: (1) that dimensions of course attitudes, instructor credibility, attraction, and homophily are significantly related to immediate recall, and (2) that dimensions of course attitude, instructor credibility, attraction, and homophily are significantly related to student-teacher interaction. Involvement, competence, homophily, task attraction, and grade point averages were positively related to recall; social attraction was negatively related. Out-of-class information-seeking interaction between student and teacher was found to be positively related to involvement, character, extroversion, and social attraction, but negatively related to importance, competence, and homophily. (Author/CH)

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THE RELATIONSHIP OF COURSE ATTITUDES, INSTRUCTOR CREDIBILITY, ATTRACTION, AND HOMOPHILY TO IMMEDIATE RECALL AND STUDENT-INSTRUCTOR INTERACTION

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ABSTRACT

This study tested the relationships among attitudes toward a course, instructor credibility, attraction, homophily, immediate recall, and student-teacher-interaction. The question of how much variance on immediate recall and student teacher interaction is attributable to course attitudes and instructor valence was the focus of the research. Student grade point average was used as a control variable. The following propositions were tested: (1) Dimensions of course attitude, instructor credibility, attraction, and homophily are significantly related to immediate recall. (2) Dimensions of course attitude, instructor credibility, attraction, and homophily are significantly related to student-teacher interaction. Multiple regression analysis, and canonical correlation were used as statistical tests. Involvement, competence, homophily, task attraction, and GPA were positively related to recall; social attraction was negatively related. Out-of-class, information-seeking interaction between student and teacher was found to be positively related to involvement, character, extroversion, and social attraction, but negatively related to importance, competence, and homophily.

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THE RELATIONSHIP OF COURSE ATTITUDES, INSTRUCTOR CREDIBILITY, ATTRACTION, AND HOMOPHILY TO IMMEDIATE RECALL AND STUDENT-INSTRUCTOR INTERACTION

A complete, though nonexistent, theoretical model of learning in the academic environment might well contain units regarding motivation, ability, anxiety, attitudes, achievement, instructional methods, task complexity, comprehension, memory, and numerous other elements related to this complex communication process.[1] Learning outcomes in this environment have generally been focused upon information acquisition and/or the change-adoption of attitudes and behaviors. The focus of this study was upon the attitudinal unit and its relation to student learning. More specifically, the study investigated the relationship of attitudes toward the instructor (credibility, attraction, homophily) and course (intensity, importance, involvement) to information acquisition (immediate recall) and interaction behavior (frequency of interaction with instructor).

Review and Rationale

In general, institutionalized education is a communication process restricted to a social context in which the instructor largely controls and is responsible for student learning. This characteristic is particularly relevant to typical speech communication instruction. Considerable research in speech communication has investigated the impact of variables targeting the source of communication.[2] Source variables such as credibility, interpersonal attraction, and homophily have been found to have impact on attitude formation-change, behavior change, and interpersonal interaction. Recent research has found dimensions of credibility--particularly character, sociability, and competence--to be significantly related to learning outcomes of recognition and recall of acquired information.[3] To the extent that interpersonal attraction reflects favorable predispositions toward a source of communication on other dimensions, similar effects can be expected for this construct.[4] Likewise, homophily which targets similarity between source and receiver should relate to information acquisition. To the extent that receiver and source are alike, they are more likely to share common linguistic structure and semantic content for verbal and nonverbal symbols or codes used. This commonality of experience and personal characteristics leads to more effective communication.[5] Also, if a person uses his perception of himself as a basis for evaluating another's credibility and attraction, his perception of homophily with another should be closely related to perceptions of credibility and attraction. These variables involving the source of communication have been related to each other in a formulation which seeks to explain the components of source valence and their relationship to communication outcomes.[6]

If the classroom instructor is regarded as a dominant source of communication for the student, then research in this area possesses important implications for improving instructor effectiveness and, in turn, the educational-communication process. However, little research has investigated these relationships. No research has applied this construct to student learning in the institutionalized, educational environment. Neither has there been research which has attempted to investigate the generalizability of results of studies on individual source variables to the instructional, teacher-student context.

In this environment, student-teacher interaction should also be positively related to learning. Since interaction and feedback generally increase accuracy[7]

and potentially increase redundancy, we would expect greater student recall of acquired information to result. Positive predispositions toward sources--whether this is in terms of credibility, attraction, or homophily--are often related to frequency of interaction and information seeking.[8] Also, attitudes toward the content or concepts about which the source communicates appears to be related to information seeking behavior[9] which, in turn, may lead to interaction and learning. On the other hand, immediate recall, as an index of cognitive learning, may indicate what learning of information has occurred. If immediate learning has not occurred, then that impairs efficiency, long term learning, and relearning of information. This, of course, affects the nature of subsequent student-teacher interactions (i.e., repetition of material, more interaction with the 'poorer' student, etc.).

Considerable research has investigated the relationship between attitudes toward concepts and various types of comprehension.[10] Recent research on the public communication context has demonstrated that attitude intensity and salience are significant, independent predictors of perceptual accuracy and are related with other variables to the prediction of recall.[11] To the extent that perceptual accuracy is prerequisite to accurate recall of information, then attitudes toward concepts affect recall. However, empirical investigation of the relationship of the multidimensional construct of attitude (direction, intensity, salience) to recall by students in the actual academic setting is absent in communication and educational literature.

Focus of the Study

On the basis of the above rationale, this study tested the relationships among attitudes toward the course, instructor credibility, attraction, homophily, recall of information about the course, and student-instructor interaction. The question of how much variance on immediate recall and student-teacher interaction is attributable to these attitudinal variables collectively was the focus of the research. The following propositions were tested:

1. Dimensions of course attitude, instructor credibility, attraction, and homophily are significantly related to immediate recall.

2. Dimensions of course attitude, instructor credibility, attraction, and homophily are significantly related to student-teacher interaction.

The boundaries of this research were opened to include a non-attitudinal, control variable related to student learning. The Ss cumulative grade point averages (GPA) were included in the analysis to provide a basis for observing the importance of attitudinal variables in relation to other variables operative. GPA was thought to be a general indicator of student achievement, motivation, and ability.

METHOD

Procedure

A sample of 118 Ss was selected from sections of the basic communication course at West Virginia University. In order to increase variability of source inductions, the students were from ten sections with ten different instructors.

Ss were first tested with booklets containing instruments on attitude toward the course, instructor credibility, homophily, attraction, and student-teacher interaction. These booklets were labelled as course-instructor evaluations. Each instructor then read a short message on changes that were going on to be made in the course for the next semester. The posttest on recall was administered immediately after the message was read.

Operationalizations

Attitudes toward the course were operationalized as students' marking behavior on semantic differential-type scales. Attitude intensity and direction was measured on evaluative semantic differential scales.[12] These were right-wrong, good-bad, harmful-beneficial, fair-unfair. Attitude salience was measured on dimensions of importance and involvement with scales developed by Weidman.[13] For importance, the scales were significant-insignificant, major-minor, recognized-unrecognized, relevant-irrelevant, for involvement, engaging-not engaging, obligated to-not obligated to, identified with-not identified with, reflection of myself-not a reflection of myself. Credibility of the instructor was measured with recently developed teacher credibility scales[14] tapping five dimensions: (1) Character--selfish-unselfish, kind-cruel, sympathetic-unsympathetic, nice-awful; (2) Composure--poised-nervous, relaxed-tense, calm-anxious, composed-excitable; (3) Sociability--sociable-unsociable, cheerful-gloomy, good natured-irritable, friendly-unfriendly; (4) Competence--expert-inexpert, reliable-unreliable, intelligent-unintelligent, qualified-unqualified; (5) Extroversion--aggressive-meek, verbal-quiet, bold-timid, talkative-silent. Students' perceptions of homophily were measured with the following semantic differential-type scales developed by McCroskey and Hamilton:[15] Like me-unlike me, similar to me-different from me, thinks like me-doesn't think like me, shares my attitudes-doesn't share my attitudes. Interpersonal attraction of the instructor was measured on Likert-type scales developed by McCroskey and McCain.[16] Three dimensions of attraction (social, physical, task) were tapped with the following scales: (1) Social attraction--I think he (she) could be a friend of mine; it would be difficult to meet and talk with him (her); we could never establish a personal friendship with each other; I would like to have a friendly chat with him (her). (2) Physical attraction--I think he (she) is quite handsome (pretty); he (she) is very sexy looking; I find him (her) very attractive physically; I don't like the way he (she) looks. (3) Task attraction--He (she) is a typical goof-off when assigned a job to do; I have confidence in his (her) ability to get the job done; if I wanted to get things done I could probably depend on him (her); I couldn't get anything accomplished with him (her). In order to measure student-teacher interaction, Ss were asked to give numerical responses to the following questions:[17] (1) How many times have you personally interacted with him (her) in class? (2) How many times have you personally interacted with him (her) outside of class? (3) How many times have you actively asked for information from him (her) in class? (4) How many times have you actively asked for information from him (her) outside of class? The recall test was a modification of the "cloze" procedure developed by Taylor.[18] The Ss were given the text of the message with 54 words selectively omitted and were asked to fill in the blanks. Exact word replacements or stems were accepted as correct. Students were asked to list their overall GPA in spaces provided on the test booklets.[19]

Statistical Analysis

Multiple regression analysis with a step-wise, maximum r-square improvement procedure[20] was used to test the relationship of predictors (attitude, credibility,

homophily, attraction, GPA) to the criterion variable of immediate recall. The criterion established for termination of the regression procedure was when an entering variable produced a nonsignificant regression model or when extraction of an additional step would account for less than one per cent of variance accounted for on the criterion variable. Canonical correlation[21] was used to test the relationship of attitude, credibility, homophily, attraction, and GPA collectively to the four types of student-teacher interactions collectively. The .05 criterion was required for significance on all statistical analyses. Sums of each individual dimension of attitude (intensity, importance, involvement), credibility (character, composure, sociability, competence, extroversion), homophily, and attraction (social, task, physical) were used in the statistical analyses. Separate measures of interaction (in-class interaction, out-of-class interaction, in-class information-seeking, out-of-class information-seeking) were entered into the appropriate analysis.

RESULTS

On the criterion variable of immediate recall, a significant effect was observed ($F=2.95$; 5, 112 d.f.) for the five-variable regression model. A maximum of 12 per cent of the variance in immediate recall was accounted for by involvement, competence, homophily, social attraction, and task attraction. Social attraction and homophily were negatively related to recall. The regression formula was the following: $Y=17.31$ + Social Attraction (-0.91) + Task Attraction (0.57) + Involvement (0.32) + Competence (0.39) + Homophily (-0.25). In a subsequent regression analysis including the control variable of GPA a significant regression model ($F=4.39$; 5, 112 d.f.) was composed of involvement, competence, social attraction task attraction and GPA. This model accounted for 16 per cent of the variance on immediate recall, an increase of 4 per cent. Social attraction alone was negatively related to recall; homophily failed to enter the model. The regression formula was the following: $Y=3.70$ + GPA (0.59) + Competence (0.41) + Social Attraction (-0.98) + Involvement (0.27) + Task Attraction (0.54).

In regard to the variables concerned with student-teacher interactions, significant results were also observed. The canonical correlation ($r=.60$) between the attitudinal variables and the interaction variables was significant ($X^2=88.16$; 52 d.f.). The canonical variable related to attitudes was dominated by seven significant contributors--Character ($r=.33$), Sociability ($r=.28$), Competence ($r=-.35$), Extroversion ($r=.31$), Social Attraction ($r=.20$), Physical Attraction ($r=.23$), and Task Attraction ($r=-.20$). The canonical variable related to interactions was significantly associated with only one contributor--out-of-class, information-seeking interactions ($r=.93$). In-class interactions ($r=-.13$), in-class, information-seeking interactions ($r=-.10$), and out-of-class interactions ($r=-.03$) were not significant contributors. The attitudinal variables noted were significantly related to the interaction variables of which out-of-class information-seeking was dominant.

SUMMARY AND DISCUSSION

The results of this study indicated significant relationships between immediate recall and attitudes toward course and instructor. The students' attitudinal involvement, along with their perceptions of the instructor's competence, homophily,

social attraction, and task attraction accounted for 12 per cent of the variance in immediate recall. A meaningful amount of variance in recall was attributable to these dimensions of course attitude and instructor valence alone, a 12 per cent variance in recall could mean a difference of one or two letter grades for the student. These results also tend to support the rationale and research proposition presented in this study. While student ability, motivation, and achievement (as reflected by GPA) affect learning, a teacher's success in securing this type of learning appears to be partially dependent on students' perceptions of his competence, homophily, social attraction, and task attraction. Also, the extent to which students have attitudinal involvement in the course apparently affects this type of learning. In this communication context, the teacher might well enhance learning by giving attention to dimensions of students' perceptions of the course and of him as a communication source.

Student-teacher interaction (predominantly out-of-class information-seeking) was significantly related to dimensions of instructor valence. Students' perceptions of their instructor's character, sociability, extroversion, social attraction, and physical attraction were positively related to this type of student-teacher interaction; instructor dimensions of competence and task attraction were negatively related. However, since only one type of interaction was significantly associated with the canonical variable, then multiple regression analysis on that single criterion for interaction would appear to have been a more appropriate statistical procedure. Post hoc analysis revealed a significant, seven-variable regression model ($F=6.55$, 7, 110 d.f.) composed of involvement, importance, character, competence, extroversion, homophily, and social attraction which accounted for 29 per cent of the variance in out-of-class, information-seeking interactions. Involvement, character, extroversion, and social attraction were positively related to the criterion; importance, competence, and homophily were negatively related. Competence accounted for the most variance (5 per cent) in this type of interaction. GPA, attitude intensity, and composure were not significantly related to student-teacher interaction of this type in either analysis.

The results of these two analyses are comparable. Character, extroversion, and social attraction were positively related to this type of interaction. The regression analysis indicates that variance in interaction attributable to sociability and physical attraction (significant in the canonical correlation) was accounted for more efficiently by other variables, perhaps by social attraction. Competence was negatively related to out-of-class, information-seeking interactions in both analyses. Apparently task attraction (significant in the canonical correlation) accounted for much of the same variance in this type of interaction as competence or some other related variable.

Apparently, positive perceptions of the instructor's character, extroversion, and social attraction are closely related to a higher frequency of student-teacher interaction, particularly when the student is seeking information out of class. The student's attitudinal involvement in the course is also related to this interaction behavior. However, the results suggest that student perceptions of increased competence and perhaps task attraction for the instructor are related to decreased student-teacher interactions of this nature. Why attitudinal importance and homophily are related to this decrease is unclear at this point. Again, the instructor, as a major source of communication for the student, might possibly enhance this type of interaction by attending to the appropriate dimensions of students' attitudes toward him and the course. However, the results of this study appear to place the instructor-communicator in a dilemma. If he is perceived by his students as sociable, extroverted, and of high character, then they may seek

him out for information but not if he appears too competent or task oriented. However, positive perceptions of his competence and task attraction which appear to be detrimental to interaction may relate to increases in some types of learning (i.e., immediate recall). Obviously, this problem will have to resolved by further research on other types of learning and the value of specific types of interactions.

REFERENCES

[1]Sarnoff Mednick, Learning (Englewood Cliffs: Prentice-Hall, Inc., 1964).

[2]K. Andersen and T. Clevenger, Jr., "A Summary of Experimental Research in Ethos," Speech Monographs, 30 (1963), 59-78; V. J. Lashbrook, "Source Credibility: A Summary of Experimental Research," paper presented at the Speech Communication Association Convention, San Francisco, December, 1971.

[3]L. R. Wheeless, "The Relationship of Attitude and Credibility to Comprehension," paper presented at Speech Communication Association Convention, Chicago, December, 1972; M. L. Guthrie, "Effects of Credibility, Metaphor, and Intensity on Comprehension, Credibility, and Attitude Change," master's thesis, Illinois State University, 1972; P. Andersen, "Credibility and Learning," master's thesis, Illinois State University, 1972; S. Zagona and R. Harter, "Credibility of Source and Recipient Attitude: Factors for the Perception and Retention of Information on Smoking Behavior," Perceptual Motor Skills, 23 (1966), 155-168. Although most earlier research found no significant effects on comprehension, these studies had numerous methodological problems. However, two of these previous studies found "admiration for the speaker" and "authority" to affect comprehension and understanding. See R. G. Nichols, "Factors in Listening Comprehension," Speech Monographs, 15 (1948), 154-163 and H. M. Livingston, "An Experimental Study of Effects of Interest and Authority upon Understanding of Broadcast Information," unpublished doctoral dissertation, University of Southern California, 1961.

[4]E. Berscheid and E. Walster, Interpersonal Attraction (Reading, Mass: Addison-wesley, 1969); B. McLaughlin, "Effects of Similarity and Likableness on Attraction and Recall," Journal of Personality and Social Psychology, 85 (1971), 51-64. McLaughlin found likableness to influence recall.

[5]E. Rogers and F. F. Shoemaker, Communication of Innovations (New York: Free Press, 1971). Although Rogers and Shoemaker provide adequate rationale for this expectation, McLaughlin (cited above) did not find similarity as he operationalized it to be related to recall.

[6]J. C. McCroskey and V. J. Lashbrook, "Source Valence: An Improved Conceptualization," paper presented at the Western Speech Communication Association Convention, Honolulu, 1972; V. J. Lashbrook, "A Theoretical and Methodological Evaluation of Source Valence Research," paper presented at the International Communication Association Convention, Montreal, April, 1973.

[7]For example, see H. J. Leavitt and R. A. H. Mueller, "Some Effects of Feedback on Communication," Human Relations, 4 (1951), 401-410; W. V. Haney, "A Comparative Study of Unilateral and Bilateral Communication," Academy of Management Journal, 7 (1964), 128-136.

[8]Berscheid and Walster; Rogers and Shoemaker; W. B. Lashbrook, P. Hamilton, and W. Todd,"A Theoretical Consideration of the Assessment of Source Credibility as a Function of Information Seeking Behavior," paper presented at the Western Speech Communication Association Convention, Honolulu, November, 1972.

[9]For example, see J. S. Bruner and L. McGinnes, "Personal Values as Selective Factors in Perception," Journal of Abnormal and Social Psychology, 43 (1948), 150-157; H. Brodbeck, "The Role of Small Groups in Mediating the Effects of Propaganda," Journal of Abnormal and Social Psychology, 52 (1956), 166-160; L. Festinger, "Behavioral Support for Opinion Change," Public Opinion Quarterly, 28 (1964), 404-417; J. Mills, "Avoidance of Dissonant Information," Journal of Personality and Social Psychology, 2 (1965), 589-593; J. Mills, E. Aronson, and H. Robinson, "Selectivity in Exposure to Information," Journal of Abnormal and Social Psychology, 59 (1959), 250-253; L. R. Wheeless, "The Effect of Attitude, Credibility, and Homophily on Selective Exposure to Information," paper presented at the International Communication Association Convention, Montreal, April, 1973.

[10]E. Cooper and M. Jahoda, "The Evasion of Propaganda: How Prejudiced People Respond to Anti-Prejudice Propaganda," Journal of Psychology, 23 (1947), 15-25; A. L. Edwards, "Political Frames of Reference as a Factor Influencing Recognition," Journal of Abnormal and Social Psychology, 36 (1941), 34-50; A. Hasdorf and H. Cantrill, "They Say a Game: A Case Study," Journal of Abnormal and Social Psychology, 49 (1954), 129-134; P. Kendal and K. Wolfe, "The Analysis of Deviant Cases in Communications Research," in P. R. Lazarsfeld and F. N. Stanton (eds.), Communications Research: 1948-1949, (New York: Harper, 1949); J. M. Levine and G. Murphy, "The Learning and Forgetting of Controversial Material," Journal of Abnormal and Social Psychology, 38 (1943), 507-517; C. I. Hovland, O. J. Harvey, and M. Sherif, "Assimilation and Contrast Effects in Reactions to Communication and Attitude Change," Journal of Abnormal and Social Psychology, 55 (1957), 244-252; C. I. Hovland M. Sherif, Social Judgment (New Haven: Yale University Press, 1961); E. Jones and R. Kohler, "The Effects of Plausibility on the Learning of Controversial Statements," Journal of Abnormal and Social Psychology, 57 (1958), 315-320; Wheeless, 1972.

[11]Wheeless, 1972.

[12]C. E. Osgood, G. J. Suci, and P. H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957). In separate factor analyses for 156 concepts, McCroskey found these scales to load consistently (loading .60 or above with no secondary loading of .40 or above) among the top twelve of the forty evaluative scales employed, with internal reliability equaling or exceeding .90.

[13]R. Weidman, "The Development of Scales for the Measurement of Salience," master's thesis, Illinois State University, 1972. These scales loaded on each separate factor for 20 topics of varying salience and intensity. Criterion for inclusion of a scale on a factor was a loading of .60 with no secondary loading above .40.

[14]J. C. McCroskey, W. E. Holdridge, and J. K. Toomb, Teacher Credibility: An Approach to Faculty Evaluation, unpublished research monograph, West Virginia University, 1973; scales loaded on factor at .60 or above with no secondary loading of .40 or above; internal reliability approximated .90.

[15]J. C. McCroskey and P. R. Hamilton, "Measurement of Homophily," unpublished research monograph, West Virginia University, 1973. These four scales consistently loaded on the "homophily" dimension at .75 or above with no secondary loading of .40 or above. Estimate of internal reliability approximated .90.

[16]J. C. McCroskey and T. A. McCain, "The Measurement of Interpersonal Attraction," paper presented at the Western Speech Communication Association Convention, Honolulu, November, 1972. These scales loaded separately on the three factors at .60 or above with no secondary loading of .40 or above. Reliability on these scales ranged from .75 to .86.

[17]Students' reports on frequency of interaction was thought to be more valid than those of the instructor. The instructor would probably have difficulty recalling the numbers of interactions with a large number of students to account for; however, the student would have less difficulty recalling or estimating the number of times he alone interacted. Further, students' responses were more valid in determining the types of interactions involved (i.e., the teacher might not recognize that the student was intending to seek information in some out-of-class interactions).

[18]W. L. Taylor, "Application of 'Cloze' and Entropy Measures to the Study of Contextual Constraints in Samples of Continuous Prose," doctoral dissertation, University of Illinois, 1954. Split-half reliability for the test used was .92.

[19]Students' estimates of their own GPA was necessary to (1) guarantee anonymity for the pretest which was camouflaged as a course evaluation and (2) prevent violation of the students' rights to privacy of such information. Voluntary disclosure of GPA under the shield of anonymity was thought to be a satisfactory estimate of this index of achievement, ability, and motivation.

[20]F. J. Kelly, et. al., Research Design in the Behavioral Sciences: Multiple Regression Approach (Carbondale: Southern Illinois University Press, 1969); A. J. Barr and J. H. Goodnight, A User's Guide to the Statistical Analysis System (Raleigh, N. C.: Student Supply Stores of North Carolina State University, 1971). This regression procedure allows for a full range of variability in predictor (independent) variables. Also a number of predictors can be used collectively to determine how much variance they account for on a criterion (dependent) variable. Maximum r-square procedure is similar to all possible regressions in which the best square procedure is similar to all possible regressions in which the best regression models which account for the most variance are selected.

[21]F. J. Kelly, et. al., pp. 244-248; Barr and Goodnight; briefly canonical correlation allows for correlating two data sets or two groups of variables rather than single pairs of variables as in the Pearson product-moment. Composite scores of the two sets are correlated. New canonical variables are created from correlations of variables in groups one and two. This statistical procedure allows for utilization of a number of indices of a certain behaviors (i.e., interaction) in a single analysis.